

CLAIMS

1. A composition comprising

(a) an antimicrobial material; and

5 (b) an extract obtained from or obtainable from a plant of the Labiate family,
wherein (a) and (b) are different

wherein the composition contains phenolic diterpenes in an amount of greater than
1.0wt.% , based on the composition,

and wherein when the antimicrobial material consists of nisin, the composition comprises

10 carvacrol in an amount of less than 0.075wt.% based on the composition and carvone in
an amount of less than 15wt.% based on the composition.

2. A composition according to claim 1 wherein the composition comprises carvacrol
in an amount of less than 0.075wt.% based on the composition.

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3. A composition according to claim 1 or 2 wherein the composition comprises
carvacrol in an amount of less than 0.04wt.% based on the composition.

20 4. A composition according to claim 1, 2 or 3 wherein the composition comprises
carvacrol in an amount of less than 0.02wt.% based on the composition.

5. A composition according to any one of the preceding claims wherein the
composition comprises carvone in an amount of less than 0.075wt.% based on the
composition.

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6. A composition according to any one of the preceding claims wherein the
composition comprises carvone in an amount of less than 0.04wt.% based on the
composition.

30 7. A composition according to any one of the preceding claims wherein the
composition comprises carvone in an amount of less than 0.02wt.% based on the
composition.

35 8. A composition according to any one of the preceding claims wherein the
composition comprises thymol in an amount of less than 0.1wt.% based on the

composition.

9. A composition according to any one of the preceding claims wherein the composition comprises thymol in an amount of less than 0.075wt.% based on the
5 composition.

10. A composition according to any one of the preceding claims wherein the composition comprises thymol in an amount of less than 0.05wt.% based on the composition.

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11. A composition according to any one of the preceding claims wherein the antimicrobial material is a bacteriocin.

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12. A composition according to any one of the preceding claims wherein the bacteriocin is selected from lanthionine containing bacteriocins, *Lactococcus*-derived bacteriocins, *Streptococcus*-derived bacteriocins, *Pediococcus*-derived bacteriocins, *Lactobacillus*-derived bacteriocins, *Carnobacterium*-derived bacteriocins, *Leuconostoc*-derived bacteriocins, *Enterococcus*-derived bacteriocins and mixtures thereof

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13. A composition according to any one of the preceding claims wherein the bacteriocin is at least nisin.

14. A composition according to any one of the preceding claims wherein the extract is obtained from a plant of the Labiate family.

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15. A composition according to any one of the preceding claims wherein the plant of the Labiate family is selected from rosemary, sage, oregano, marjoram, mint, balm, savoury, and thyme.

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16. A composition according to any one of the preceding claims wherein the plant of the Labiate family is selected from rosemary, sage, oregano, marjoram, mint, balm, and savoury.

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17. A composition according to any one of the preceding claims wherein the plant of the Labiate family is rosemary.

18. A composition according to any one of the preceding claims wherein the composition contains phenolic diterpenes in an amount of is greater than 2.0wt.%, based on the composition.

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19. A composition according to any one of the preceding claims wherein the composition contains phenolic diterpenes in an amount of is greater than 3.0wt.%, based on the composition.

10 20. A composition according to any one of the preceding claims wherein the composition contains phenolic diterpenes in an amount of is greater than 3.5wt.%, based on the composition.

15 21. A composition according to any one of the preceding claims wherein the phenolic diterpene is selected from carnosic acid, carnosol, methylcarnosic acid and mixtures thereof.

20 22. A composition according to any one of the preceding claims wherein the extract comprises or is selected from phenolic diterpenes, phenolic triterpenes and rosmarinic acid.

25 23. A composition according to any one of the preceding claims wherein the extract comprises a phenolic triterpene.

24. A composition according to claim 17 wherein the amount of phenolic triterpenes, based on the composition, is greater than 3.5 wt.%.

25 25. A composition according to claim 16, 17 or 18 wherein the phenolic triterpene is selected from betulinic acid, oleanolic acid, and ursolic acid.

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26. A composition according to any one of the preceding claims wherein the extract comprises a rosmarinic acid.

27. A composition according to claim 20 wherein the amount of rosmarinic acid, based on the composition, is greater than 3.5 wt.%.

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28. A composition according to any one of the preceding claims wherein the combined amount of phenolic diterpenes, phenolic triterpenes and rosmarinic acid, based on the composition, is greater than 3.5 wt.%.

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29. A composition according to any one of the preceding claims wherein the extract contains flavour-inducing compounds and/or essential oils in an amount of less than 1 wt.% based on the composition.

10 30. A composition according to any one of the preceding claims wherein the extract contains essential oils in an amount of less than 1 wt.% based on the composition.

15 31. A composition according to any one of the preceding claims wherein the antimicrobial material and/or the extract are present in an amount to provide a microbicidal or microbiostatic effect.

32. A composition according to any one of the preceding claims wherein the antimicrobial material and the extract are present in an amount to provide a microbicidal or microbiostatic effect.

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33. A composition according to any one of the preceding claims wherein the antimicrobial material and the extract are present in an amount to provide a microbicidal or microbiostatic synergistic effect.

25 34. A composition according to any one of the preceding claims wherein the antimicrobial material and the extract are present in an amount to provide a microbicidal or microbiostatic synergistic effect.

30 35. A composition according to any one of claims 31 to 34 wherein the microbicidal or microbiostatic effect is a bactericidal or bacteriostatic effect.

36. A composition according to claim 35 wherein the bactericidal or bacteriostatic effect is in respect of Gram-positive bacteria.

35 37. A composition according to claim 36 wherein the bactericidal or bacteriostatic

effect is in respect of an organism selected from species of *Bacillus*, species of *Clostridium*, *Listeria monocytogenes*, lactic acid bacteria, and *Lactobacillus* species.

38. A composition according to any one of claims 35 to 37 wherein the bactericidal or
5 bacteriostatic effect is in respect of *Listeria monocytogenes*.

39. A composition according to any one of the preceding claims wherein the composition is a foodstuff.

10 40. A composition according to any one of the preceding claims wherein the composition is a protectant composition suitable for addition to a foodstuff.

41. A composition according to claim 39 or 40 the foodstuff is selected from raw meat, cooked meat, raw poultry products, cooked poultry products, raw seafood products, cooked seafood products, ready to eat meals, pasta sauces, pasteurised soups, mayonnaise, salad dressings, oil-in-water emulsions, margarines, low fat spreads, water-in-oil emulsions, dairy products, cheese spreads, processed cheese, dairy desserts, flavoured milks, cream, fermented milk products, cheese, butter, condensed milk products, ice cream mixes, soya products, pasteurised liquid egg, 20 bakery products, confectionery products, fruit products, and foods with fat-based or water-containing fillings.

42. A composition according to any one of the preceding claims wherein the composition further comprises an emulsifier.

25 43. A composition according to claim 42 wherein the emulsifier is selected from polysorbates, monoglycerides, diglycerides, acetic acid esters of mono-diglycerides, tartaric acid esters of mono-diglycerides and citric acid esters of mono-diglycerides.

30 44. A composition according to any one of the preceding claims wherein the composition further comprises a chelator.

45. A composition according to claim 44 wherein the chelator is selected from EDTA, citric acid, monophosphates, diphosphates, triphosphates and polyphosphates.

46. A composition according to claim 44 or 45 wherein the chelator enhances the antimicrobial activity and/or antimicrobial spectrum of the antimicrobial material.

47. A composition according to claim 44, 45 or 46 wherein the chelator enhances the antimicrobial activity and/or antimicrobial spectrum of the antimicrobial material in respect of Gram-negative bacteria.

48. A composition according to any one of the preceding claims wherein the composition further comprises a lytic enzyme.

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49. A composition according to claim 48 wherein the lytic enzyme is a lysozyme.

50. A composition according to claim 1 comprising

(a) an antimicrobial material, wherein the antimicrobial material is nisin; and

15 (b) an extract obtained from a plant of the Labiatae family, wherein the extract is a phenolic triterpene selected from betulinic acid, oleanolic acid or ursolic acid wherein the antimicrobial material and the extract are present in an amount to provide a bactericidal or bacteriostatic synergistic effect.

20 51. A composition according to claim 1 comprising

(a) an antimicrobial material, wherein the antimicrobial material is nisin; and

(b) an extract obtained from a plant of the Labiatae family, wherein the extract is rosmarinic acid,

wherein the antimicrobial material and the extract are present in an amount to provide a 25 bactericidal or bacteriostatic synergistic effect.

52. A process for preventing and/or inhibiting the growth of, and/or killing a micro-organism in a material, the process comprising the step of contacting the material with

(a) an antimicrobial material; and

30 (b) an extract obtained from or obtainable from a plant of the Labiatae family,

wherein (a) and (b) are different

wherein the composition contains phenolic diterpenes in an amount of greater than 1.0wt.% , based on the composition,

wherein when the antimicrobial material consists of nisin, the composition comprises 35 carvacrol in an amount of less than 0.075wt.% based on the composition and carvone in

an amount of less than 15wt.% based on the composition.

53. A process according to claim 52 wherein the antimicrobial material and the extract are added to the material together.

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54. A process according to claim 52 wherein the antimicrobial material and the extract are added to the material sequentially.

55. A process according to any one of claims 52 to 54 wherein the bacteriocin is
10 added to the material.

56. A process according to claim 52 wherein the bacteriocin is formed *in situ* in the material.

15 57. A process according to any one of claims 52 to 56 wherein the material is a foodstuff.

58. A process according to any one of claims 52 to 57 characterised by the features of any one of claim 2 to 51.

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59. Use of (a) an antimicrobial material; and b) an extract obtained from or obtainable from a plant of the Labiateae family, for preventing and/or inhibiting the growth of, and/or killing a micro-organism in a material; wherein (a) and (b) are different; wherein the composition contains phenolic diterpenes in an amount of greater than 1.0wt.% , based
25 on the composition, and wherein when the antimicrobial material consists of nisin, the composition comprises carvacrol in an amount of less than 0.075wt.% based on the composition and carvone in an amount of less than 15wt.% based on the composition.

60. Use according to claim 59 wherein the material is a foodstuff.

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61. Use according to claim 59 or 60 for synergistically preventing and/or inhibiting the growth of, and/or killing a micro-organism in a material.

62. Use according to any one of claims 59 to 61 characterised by the features of any
35 one of claim 2 to 51.

63. A kit for preparing a composition as defined in any one of claims 1 to 51, the kit comprising
- (a) an antimicrobial material; and
 - 5 (b) an extract obtained from or obtainable from a plant of the Labiate family, wherein (a) and (b) are different in separate packages or containers; optionally with instructions for admixture and/or contacting and/or use.
- 10 64. A composition as substantially hereinbefore described with reference to any one of the Examples.
65. A process as substantially hereinbefore described with reference to any one of the Examples.
- 15 66. A use as substantially hereinbefore described with reference to any one of the Examples.
67. A kit as substantially hereinbefore described with reference to any one of the
- 20 Examples.